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(11) Publication number:

**O 100 185**  
**A2**

(12)

## EUROPEAN PATENT APPLICATION

(21) Application number: 83304105.6

(51) Int. Cl.<sup>3</sup>: **B 41 F 27/14**

(22) Date of filing: 13.07.83

(30) Priority: 26.07.82 GB 8221542

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(43) Date of publication of application: 08.02.84  
Bulletin 84/6

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(84) Designated Contracting States: AT DE GB IT NL

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(54) Improvements in or relating to printing plates.

(57) Attachment means for holding a creased printing plate comprises a shim or saddle member having an undercut leading end face adapted to clamp the leading end of the printing plate. A curved peripheral surface supports the central region of the plate. At the junction of said end face and said peripheral surface a recess secures a projecting crease rib of said creased plate.

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This invention is concerned with printing plates and, more particularly with flexible printing plates and means for securing such plates to printing cylinders.

5 In relief plate or letterpress printing a printing plate is produced by a photographic process. A backing sheet of flexible material of substantially larger area than the image to be reproduced thereon is given a sensitised coating which is then exposed  
10 to the image. The exposed sheet undergoes various treatment stages, e.g. developing, washing, etching.

A central area of the sheet is now occupied by the image which is comprised of the residual coating and thus stands proud of the backing sheet. The finished  
15 sheet has to be trimmed to form the printing plate.

Improved apparatus for cutting printing plates is described in our European Patent Application No.

82 300732.3.

Conventionally, such printing plates are made  
20 of thin aluminium or mild steel sheets and attached either directly to a shim of a printing cylinder or to a saddle which is itself attached to the cylinder. Normally two plates are attached around the circumference of a cylinder and the securement mechanism  
25 therefor comprises a simple retaining means at the leading edge of the plate, as considered in the direction of rotation of the cylinder, and a tensioning means at the trailing edge of the plate. More recently,

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printing plates have been developed which are made of thick paper or plastics material.

Improved apparatus for securing a flexible (particularly a paper or plastics) printing plate to a printing cylinder is described in our European Patent Application Nos. 82 300253.0 and 82 300254.8 both of which are mainly concerned with tensioning and locking means engaging the trailing end of the printing plate as considered in the direction of rotation of the printing cylinder in use. Holding means for the leading end of the printing plate are also described but are of more conventional design comprising a simple clamp arrangement in which the corresponding edge of the saddle is undercut to provide an acute angle between the curved peripheral surface of the saddle and the end face thereof. Attached to the saddle along the end face is a metal or plastics clamping strip which is formed so as to define a clip with this face. In this way, the leading edge of the printing plate can be retained by being pushed firmly between the clamping strip and the saddle end face so that the strip clamps the plate to the saddle.

In order to facilitate such attachment of the leading edge of the printing plate, it is normal practice to fold said edge by a preliminary folding operation. In use, the fold line of the plate extends along the edge of the saddle with the leading edge of the plate clamped against the undercut saddle

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face by the clamping strip and the image-bearing central portion of the plate held tightly against the curved surface of the saddle.

We have now discovered that certain printing plates, particularly those made of fibrous material such as paper, have a tendency to "mark-up" at the leading edge, i.e. to pick up ink from the inking cylinder in this region in spite of the absence of a prominent image. Detailed investigation of the phenomenon has revealed two reasons for its occurrence. Firstly, the folding operation tends to rupture the outer surface of the plate at the fold line so producing projecting fibres which may be inked in prolonged use. Secondly, the folding operation results in an unpredictable and irregularly projecting accumulation of fibrous material at the inside of the fold line. This surplus material acts as packing preventing the fold line from lying closely against the leading edge of the saddle.

It will be appreciated that the leading ends of printing plates may be secured to shims in analogous manner with similar problems.

It is an object of the present invention to obviate or mitigate the aforesaid difficulties.

According to the present invention, there is provided attachment means for holding a creased printing plate, comprising a shim or saddle member

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having an undercut leading end face adapted to clamp the leading end of the printing plate, a curved peripheral surface for supporting the central region of the plate and at the junction of said end face and 5 said peripheral surface a recess for securing a projecting crease rib of said creased plate.

The invention will now be further described by way of example only, with reference to the accompanying drawings, in which:-

10 Figs. 1 to 3 are diagrams showing different stages in the printing plate fitting and locking operation; and

Fig. 4 is a diagram to an enlarged scale of the folded region of the printing plate and the underlying 15 part of the saddle.

The drawings show a printing cylinder 1, which is rotatable, in use, in the direction shown by arrow 2 and which is provided with a pair of saddles 3 to each of which a respective printing plate 4 can 20 be attached by a locking mechanism according to the invention described in our European Applications Nos. 82 300253.0 and 82 300254.8.

The locking mechanism comprises holding means 5 which is located along the leading edge 6 of the 25 saddle 3 with respect to the direction of rotation of the cylinder 1. The holding means 5 comprises a simple clamp arrangement in which the edge 6 of the

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saddle 3 is undercut to provide an acute angle 7.

Attached to the saddle 3 along the edge 6 is a metal or plastics strip 8 which is formed so as to define a clip with the edge 6. In this way, the leading 5 edge 9 of the printing plate 4 can be retained by being pushed firmly between the strip 8 and the edge 6 so that the strip 8 clamps the plate 4 to the edge 6 and the plate 4 folds over the angle 7 against the surface 10 of the saddle 3.

10 At the trailing edge 11 of the saddle 3, the locking mechanism comprises a locking arrangement 12 to hold and tension the trailing edge 13 of the printing plate 4 opposing the leading edge 9 thereof against the surface 10 of the saddle. Further details 15 of the construction of the locking arrangement 12 are contained in the aforesaid European Patent Applications.

Fig. 1 shows the locking arrangement 12 in the release position ready for receiving the trailing edge 20 13 of a printing plate 4. The holding means 5 is about to receive the leading edge 9 of what may be assumed for the purposes of illustration to be the same printing plate 4. The printing plate 4 is fitted to the saddle 3 by inserting the leading edge 9 in 25 the direction of the arrow in Fig. 1 into the nip defined by the edge 6 of the saddle 3 and the clamp- ing strip 8. The trailing edge 13 of the plate 4 is

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then inserted. Fig. 2 shows both leading and trailing edges 9,13 of the printing plate 4 fully inserted, and finger pressure being used to push the locking arrangement 12 towards the locking position shown in

5 Fig. 3.

The leading edge 9 of the printing plate 4 is shown pre-folded in Fig. 1. In contrast to prior folding methods which involved a simple bending operation the present invention uses a creasing technique which may, however, be entirely conventional save in its application to the folding of a printing plate. In one example, the creasing operation is of the kind frequently used in the carton-making industry whereby a creasing rule engages a cooperating groove so as to trap and deform the material to be creased. The resultant crease has a well-defined rib at one side and an indentation at the opposite side. A creasing operation combined with a cutting operation for flexible printing plates is described in our 15 co-pending European Application No. 82 300732.3.

As shown in Fig. 4, the creasing operation produces on the inside of the fold a crease rib or projection 14 of predictable, regular profile. Accordingly, it is possible to provide at the angle 25 7 of the saddle leading edge 6 a recess 15 in which the crease rib 14 is accommodated. By suitably dimensioning the recess 15 with respect to the

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crease rib 14 it is possible to ensure that the leading end region 4a of the printing plate 4 in advance of the image portion 4b thereof lies flat on the saddle 3 and has no tendency to project or 5 ride up to cause unacceptable marking-up.

In one example, the printing plate is creased with a 2-Point creasing rib (0.71 mm) and we have found that the crease rib so produced can be readily accommodated in a recess of rectangular profile (as 10 illustrated in Fig. 4) having sides of length 1 mm.

It will be appreciated that different sizes of crease rib produced by different creasing rules will require appropriately dimensioned recesses. Furthermore, the recess need not necessarily have the shape 15 shown in Fig. 4. It could, for example, have two sides of unequal length, more than two sides (i.e. polygonal in profile), or a curved profile.

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CLAIMS:

1. Attachment means for holding a creased printing plate, comprising a shim or saddle member having an undercut leading end face adapted to clamp the leading end of the printing plate, a curved peripheral surface for supporting the central region of the plate and at the junction of said end face and said peripheral surface a recess for securing a projecting crease rib of said creased plate.  
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- 10 2. Attachment means as claimed in claim 1, wherein said recess has two mutually perpendicular adjoining surfaces respectively meeting said peripheral surface and said end face of said member.
- 15 3. Attachment means as claimed in claim 2, wherein said adjoining surfaces are of equal width.
- 20 4. Attachment means for holding a creased printing plate, substantially as herein described with reference to and as illustrated in the accompanying drawings.

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